NORTH CAROLINA
RECYCLING BUSINESS
ASSISTANCE CENTER

A cooperate effort of the NC Department of Environment, Health, and Natural Resources and the NC Department of Commerce

RecyclingWorks

Volume 2, Number 3, August 1996

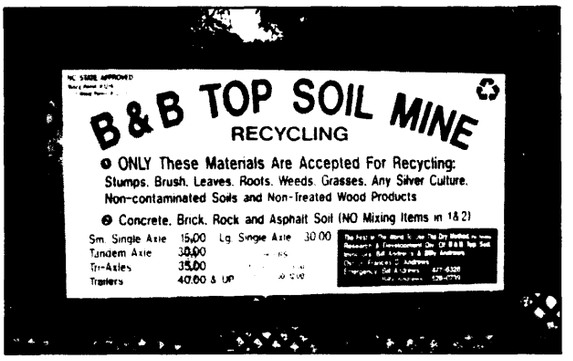
Converting Debris Into Organic Topsoil - Without Grinding?

by John Nelms, RBAC Market Development Specialist

In the first quarter** of **1996, RBAC solicited proposals** from **companies for** regional aggregate projects. **B&B Organic Compost & Soils was** selected to **receive** project **funds of $90,000.

CHALLENGE Request For Proposals Enclosed GRANTS

To convert tree stumps, limbs, and other land-clearing debris waste into a highly marketable, rich, organic topsoil without any grinding sounds too good to be true. But that is exactly what B&B Organic Compost & Soils, Inc., of Durham has been able to accomplish. B&B's patented "Dry Method" requires no heat, turning, chemicals fertilizer, water, or grinding and produces no methane gas.



Stumps and yard waste are turned into highly organic oil at B&B Top Soil Mine

'Dry Method" Process

Bill Andrew, a vice president with B&B, invented the "Dry Method" process. Mr. Andrews, a mechanic by trade, spent approximately two decades perfecting this unique, yet simple process. First, debris is dumped into piles and is allowed to sit untouched for two to three years. At the point masture-absorbing vegetation is observed to grow from the pile, the material is ready to be processed.

The material is then transferred into a sifting screen on which topsoil is separated from the partially degraded waste and moved to a separate pile. The remaining material is returned to piles for another round of the drying process. This procedure is carried out until there is no material left. Mr. Andrews says, We do not waste anything, because that is money to us. Everything is run until there is nothing left but rocks, and we put that back onto the road."

Highly Organic Topsoil

To some, the "Dry Method" may sound like another form of comporting, but experts support Andrews' assertion that it is a highly organic topsoil. In the professional opinion of Dr. Robert Rubin, Extension Specialist and Associate Professor in Agricultural Engineering at North Carolina State University, there is a difference. "Based on my knowledge of soil and compost," Dr. Rubin says, "the material of the invention ("Dry Method") is significantly moresimilar to a soil product than to composts and is a unique product."

License Negotiations

B&B's business has steadily grown over the years. With gross revenues in 199S of $300,000 to $400,000 and a solid track record, B&B has begun to license its soil development process. Progressive Soil Farms of Davidson County is the first purchaser of rights to produce topsoil using the "Dry Method." B&B is currently in negotiations with several other potential licensees and hopes to eventually have about 100 sites licensed. That sort of growth could lead to potential royalty income of $3 to $4 million.

Andrews says the key to B&B's success is simple. "The main thing is treat everybody like you would want to be treated. You want to treat your customer absolutely right."+

Inside

Construction Waste: An Economic Opportunity

by Bobbi Tousey, RBAC Manager

Construction and demolition wastes have significant recovery and reuse potential.

In 1995, the NC Office of Waste Reduction produced a report entitled *Assessment of the Recycling Industry and Recycling Materials in North Carolina -1995 Update (the* Study). In The Study, supply and demand data for 38 commodities including construct on and demolition (C&D) wastes are compiled and analyzed. Although the Study does not focus directly on ways to reduce construction waste, it provides valuable information on economic opportunities of C&D recovery.

Little information exists on the amount of C&D waste generated in North Carolina each year. For the purposes of the Study, the supply of C&D waste was assumed to be the amount of C&D material disposed in North Carolina landfills, i.e., approximately 7.8 percent of the total waste stream or about 721,000 tons per year. This amount is smaller than the 20 percent commonly cited. Some possible reasons suggested for the discrepancy are that C&D waste is being transported out of the state, goes to facilities without scales, or is discarded illegally. Not surprisingly, over 65 percent of C&D waste is generated by the central area of the state with the remainder spread evenly over the other regions.

C&D Waste Stream

At 30 percent, wood makes up the largest component of C&D waste, while asphalt shingles make up *23* percent. Sheetrock comprises 18 percent of the waste stream, followed by asphalt (5 percent), brick (3 percent), and "other" materials (20 percent). The following examples illustrate the potential of recovery and reuse of building wastes as some C&D wastes are increasingly collected and reused.

✓ Wood scraps are recovered from building or central processing sites by several North Carolina businesses and resold. Small pieces of wood are collected, chipped, and shredded for a variety of markets including pulp, mulch, compost, and composites. This reuse represents a savings for builders who do not have to pay to have the material hauled away and those looking for alternatives to increasingly expensive building materials.

✓ In the past, used asphalt shingles have had few markets. The Study indicates that contractors are willing to recycle shingle wastes to reduce landfill costs. Recently, the RBAC funded a test project designed to determine if asphalt shingles can be added cost effectively to paving material for use by the NC Department of Transportation (NC DOT). If the tests are satisfactory, NC DOT could utilize most 01 the used shingles currently discarded in the state.

✓ Gypsum wallboard is comprised primarily of gypsum (calcium sulfate) and a paper backing. After the paper is separated, it can be recycled for use in other paper products. Gypsum has been used successfully as a soil amendment, acting much like limestone. In addition, in its capability to absorb odors and liquids, gypsum offers promising product development potential as kitty litter and oi absorbent. RBAC has contracted with the NCSU Department of Animal and Poultry Waste Management Center to investigate the feasibility of using gypsum as part of a dry bed system in swine houses. If tests are positive, commercial trials will be undertaken.

Companies are discovering that C&D wastes are valuable commodities that should not be discarded but reused or remanufactured into new products. In the next five yearn, mounds *c* debris at construction sites may disappear - to the benefit of builders, manufacturers, and the environment. ◆

RBAC Receives Second EPA Grant

by Bobbi Tousey, RBAC Manager

In support of the quality and dimension of the Recycling Business Assistance Center's (RBAC's) work with the North Carolina's recycling industry, the U.S. Environmental Protection Agency (EPA) recently awarded RBAC a second grant. The first grant in 1994 funded establishment of the RBAC. A component of EPA's Jobs-Through-Recycling Initiative, the 1996 award will enable the Center to build and expand the work already underway.

Feedstock Conversion Project

One task under the original grant was to demonstrate the process by which an existing North Carolina company can convert from virgin feed stock to recycled materials as process input. This demonstration project is underway and yielding significant results. Through preliminary research, RBAC estimates that more than 1,000 other NC companies could have similar potential for feedstock conversion.

Target Manufacturing Base

A logical next step is to systematically target this large segment of the manufacturing base and focus resources on widespread conversion of the feedstock used by those industries. Tasks outlined in the 1996 grant proposal initiate that process. RBAC will target major industrial sectors in North Carolina and guide selected industries through the feedstock conversion process.

RBAC Guidance

RBAC'S guidance to those industries will combine direct technical, financial, and follow-up assistance; technology development; and educational seminars. This project will expand and further institutionalize the unique synergy between the economic development and the environmental communities in North Carolina by promoting recycling opportunities.

Project Goals

Goals of the project include the following:

- Utilize significant amounts of reclaimed materials in manufacturing operations in place of virgin feedstock.
- Help reduce greenhouse gases by reducing the use of virgin materials and the flow of waste to North Carolina's landfills.
- Accurately measure the effects of materials substitution on job creation, capital investment, and capacity utilization.
- Leverage the outstanding resources available from numerous research, information and educational organizations throughout the state.
- Review and approve at least $500,000 in loans to feedstock conversion clients through private financing channels.◆

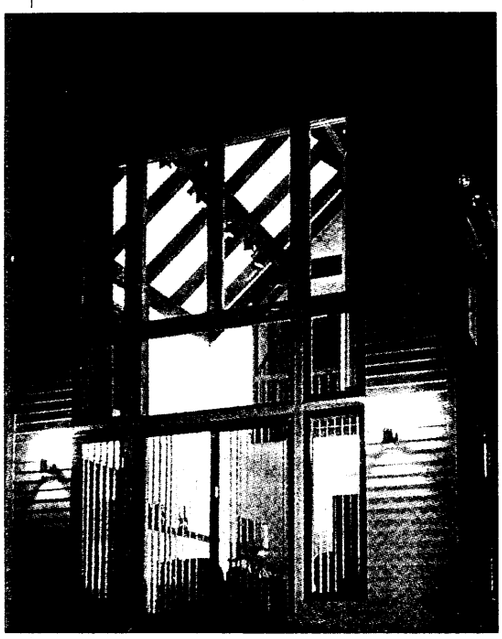
RecyclingWorks is published by the NC Recycling Business Assistance Center (RBAC), a program of the Division of Pollution Prevention and Environmental Assistance of the NC Department of Environment, Health, and Natural Resources (DEHNR).
For more information call 919/715-6500 or 800/783-0138 or write to P.O. Box 29589, Raleigh, NC 27828-9569

Construction Products From Recycled Materials

by Bobbi Tousey, RBAC Manager

As the price of virgin goods rises, materials and products made out of recycled substances become increasingly cost efficient. By using recycled materials, builders can keep costs down while helping the environment and appealing to consumers. Examples of building products with recycled content or environmentally favorable attributes now available are described below.

One product the Homasote Company produces with recycled content is Easy-Ply Roof™ decking.



. Environmentally friendly floor coverings are already in widespread use. Traffic Tile™ produced by Stoneware Tile Company in Richmond, Ind., is comprised of more than 70-percent recycled glass. Because of Stoneware Tile's glass-bonding technique, Traffic Tile™ withstands harsh elements. In addition, it is fully vitrified, has low porosity, is frost-proof, and is simple to install.

- Carpet made out of recycled PET soda bottles has also been on the market for many years. Hartex ™, manufactured by Leggett & Platt in Villa Rica, Ga., is a carpet pad made from byproducts of the broadloom carpet manufacture ng process. No binders or chemicals of any kind are added.
- BASF of Mount Olive, N. J., has recently launched 6ix Again, a nationwide nylon carpet recycling system that transforms old nylon carpet into new products. In the process, used carpet is taken to collection centers across the country where it is shredded into a form that allows the fiber and backing materials to be separated. The resulting polymer is indistinguishable from virgin carpet material. Other possible uses of the recovered carpet components include molded plastics, concrete fillers, road bed liners, and other construction materials.
- The Decade ShowCase™ from Raynor in Dixon, Ill., is an energy-saving garage door with a thermal break and a 1 7/8"-thick, expanded polystyrene core that is completely bonded between steel skins. This insulation contains no ozonedestroying CFCS or HCFCs. With the company's EnduraCote System, the door also features power-coated hardware components that match the interior of the door.

  The EnduraCote hardware is made of hotdipped galvanized steel that has the appearance of finished paint. The powder coat is corrosion resistant, offers greater scratch resistance than most paint, and is free of the environmental hazards of paint.

Recycled Wood Products

With costs of virgin timber increasing, products made out of recycled wood have also become much more cost efficient.

- Pioneer Millworks in Shortsville, N. Y., salvages and resaws timber previously used in commercial buildings into high-grade wood products. At the turn of the century, much lumber of this quality was used for structural timbers in large buildings, and it is unmatched by timbers harvested today.
- Ti mbrex™, a wood-polymer composite produced by Mobil Chemical Company in Norwalk, Corm., is made of 100-percent recycled wood and plastic. It uses no toxic preservatives and is fully recyclable when returned to the company. The resulting product is more resistant to damage and decay caused by moisture, solvents, insects, and UV rays; and it will not splinter or crack. Timbrex™ is used to replace wood and other materials in building decks, guardrails, sign posts, industrial flooring, and exterior building trim.

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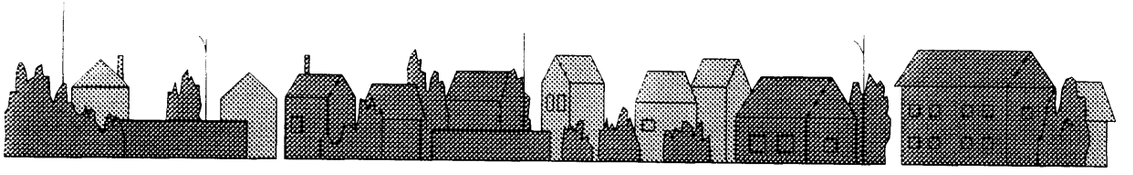
While some recycled wood or wood-substitute products have been in the marketplace for years, a variety of lesser-known products are beginning to appear.

- W.H. Maze Company in Peru, Ill., manufactures Maze Nails™, which are made from remelted steel. The advantages of this process are two-fold: less steel is thrown into landfills, and less mining is necessary to satisfy demands for steel. In addition, the scrap is sent back to the steel mills for re-melting. The cardboard boxes that package the nai Is are also made from recycled paper products.
- For those interested in environmentally friendly home furnishings, The Knoll Group in Grand Rapids, Mich., produces several product lines that are constructed with wood from certified sustainable forests. In the company's newest product, the Parachute Chair™, pre-consumer recycled nylon from waste generated in carpet manufacture is used to make its structural frame. In addition, 100-percent post-consumer recycled plastic is used for the arms, conventional polypropylene is used for the shell, and VOC-free adhesives are used throughout the piece.
- SteelCase Corp. obtains wood only from domestic or tropical sources that can demonstrate sustainable forestry practices. Where possible, water-based finishes and glues are used, and all CFCS and HCFCS are eliminated. Some recycled content is present in the product's packaging materials. The company's goal is to reduce overall waste production by 75 percent before next year.
- Haworth in Grand Rapids, Mich., also builds furniture made from wood from managed sustained forests. It is the company's policy to reduce, reuse, and recycle as much packaging material as possible. Haworth also produces office partitions, which the company buys back, refurbishes, and resells. ❖

Request for Proposals: Pollution Prevention Challenge Grants

DPPEA is soliciting proposals for its Pollution Prevention Challenge Grant program. Matching grants up to $15,000 ($20,000 for businesses having under 100 employees) are available for projects that demonstrate an innovative pollution prevention technology or recycled feedstocks in place of virgin feedstocks. The deadiine for proposals is August 31, 1996. See the enciosed flyer for information on submitting a proposal and a Challenge Grant project summary form. For more information, caii David Williams at (91 9)715-6527.



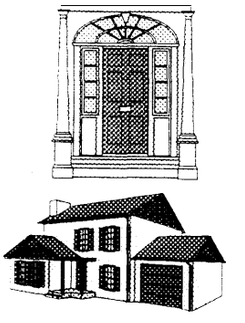
"Building in Balance: Environmental and Economic Solutions"

Second Annuai Southeastern Green Building Conference & Exhibition

Sponsored by the North Carolina Energy Division and
the North Carolina Recyciing Association

The North Carolina Green Building Council is hosting the Second Annual Southeastern Building Conference & Exhibition on October 7-9, 1996, at the Wilmington Hilton in Wilmington, N.C. The event will unite architects, builders, engineers, realtors, contractors, government officials, and homeowners across the Southeast to iearn the latest in green building design, construction, and technology.

For registration information, contact the North Carolina Recyciing Association (NCRA) at (919) 851-8444, fax (919) 851-6009, or write to NCRA at 7330 Chapel Hill Road, Suite 207, Raleigh, NC 27607.



Self-Help and RBAC Partnership: The North Carolina Recycling Finance Project

By Matt Ewadinger, RBAC Market Development Specialist

. . . limited access to capital and cash flow problems are the most frequently cited obstacles to business growth for all recycling companies except scrap metal.

The North Carolina Recycling Business Study (see *Recycling Works*, August 1995), recommends that small business financing programs be marketed to recycling companies and that lenders and investors become better educated about recycling businesses. The Study also points out that limited access to capital and cash flow problems are the most frequently cited obstacles to business growth for all recycling companies except scrap metal dealers.

NCFRP Developed

To address these recommendations and obstacles to business growth, Seif-Heip, North Carolina's community development banking group, and RBAC have deveioped a partnership to impiement the North Carolina Recycling Finance Project (NCRFP). "Over the next 12 months, Self-Help will undertake a range of activities directed to building our capacity to serve the recycling industry and increase the capital available to firms in that industry," said Robert Schall, President of Self-Help Ventures Fund. Designed to foster capital access for recycling companies, the NCRFP has five major objectives.

- **Objective 1 : Market Self-Help to the Recycling Industry**

Self-Help will embark on a marketing program designed to inform recycling businesses about the financing instruments that are available to them. The NCRFP Team plans to survey the industry, contact a large number of recycling businesses directly, make four major presentations to recycling firms and organizations, and prepare promotional materials specifically targeted to the recycling industry.

- **Objective II: Train Self-Help's Loan Officers**

"Self-Help is known for its ability to adapt financing programs to the needs of businesses. in order to provide this value-added service to recycling companies and entrepreneurs, our ioan officers must have a better understanding of the technical aspects of the industry," said Schall. With this in mind, the Project Team will train Self-Help's ioan officers and administrative staff on technological, market, and structural specifics of the different sectors of therecycling industry.

- **Objective III: Develop Financial Performance Information**

The Project Team will deveiop a database of financial performance information for firms in the recycling industry. Banks and other financial intermediaries reiy on this kind of information to make informed iending decisions. The information will be retrieved from a broad range of specialized sources relevant to the recycli ng industry.

- **Objective IV: Approve $1 Million in Loans to Recycling Businesses**

Self-Help pi edges to review and approve at ieast $1 million in loans to new and expanding recycli ng businesses as part of this Project. New capital of $1 million, a significant first effort to meet the capital needs of this growing industry, will give Self-Help a solid foundation for future iending in this industry.

- **Objective V: Develop Recommendations for Creation of a Specialized Loan Program**

Based on its experience and the experience to be gained as a result of the Project, Self-Help will make recommendations to RBAC on the creation of a specialized ioan program targeted to recycling businesses. The recommendations will identify the optimum structure to manage such a fund and potential private and public sources of capital.

Utilize Existing Resources

The Project Team will make use of existing and available resources such as the Small Business and Technology Development Center

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and two agencies of the NC Department of Commerce, the Finance Center and the Business/I ndustry Development Division. Of strategic importance are cooperative efforts by Self-Help and RBAC to ensure that firms make maximum use of the technical, marketing, and business development assistance available from this program.

Note: For more information on the North Carolina Recycling Finance Project, contact Matt Ewadinger of RBA C at (919) 715-6504 or Robert Schall of Self-Help Ventures Fund at (919) 9564400. ✦

Polymers Extension Program Educational Events

By Bobbi Tousey, RBAC Manager

The Polymers Extension Program (PEP), a plastics research facility at North Carolina State University in Charlotte, provides in-plant engineering outreach assistance, education, training, process and product development, and engineering reference services to North Carolina companies that manufacture products from plastics and rubbers for a variety of applications. PEP offers classroom and hands-on courses that cover basic technical and manufacturing subjects for the plastics industry.

PEP will present two opportunities this fall for businesses to learn more about plastics. Recycling and recyclability will receive special emphasis.

Design of Plastic Parts Course

This comprehensive course to be held October 24 and 25 at the PEP facility in Charlotte will introduce the principles of plastic part design to those involved in the management and execution of product development programs. Particular attention will be given to design, selection of materials, and assembly techniques for the ease of product recycling. The following topics will be covered:

- A review of the basic product development cycle related to plastic product design decisions.
- A plastics materials primer including a definition of plastics, their advantages and specific properties, and the relationship of material properties to part design.
- An overview of primary and secondary plastics processing methods as they relate to design for processability. Design for moldability, assembly, and decoration will be covered in this section.
- Plastics design for functionality, including structural integrity and incorporation of features such as living hinges, spring elements, and bearing/sealing elements.
- Prototyping techniques for evaluating form, fit, and function.
- Design of end products for recyclability, including materials selection and compatibility, parts consolidation, identification and reusability, and ease of disassembly.

Industry Issues Conference

PEP and the American Plastics Council will co-sponsor an "Industry Issues" Conference on Recycling Polymers in Greensboro, N. C., on September 26. This one-day event will feature technical presentations highlighting current programs that focus on some of the tougher recycling challenges. Topics to be discussed include:

- ❑ Automobile Recycling
- ❑ Methanolysis
- ❑ Design for Recyclability
- ❑ Selective Dissolution

In addition, representatives of the American Plastics Council will discuss its expanding role in providing assistance to a variety of important recycling initiatives. For more information, contact PEP at 704-547-3972. ❖

Dickinson Named New Commerce Finance Director

RALEIGH — State Commerce Secretary Dave Phillips has named veteran banking and finance officer Stewart Dickinson the new director of the Commerce Finance Center. Mr. Dickinson's appointment became effective May 6. Dickinson, the senior vice president and chief loan officer of the Connecticut Development Authority, will replace Bruce Strickland who retired last month after 30 years of service to the state.

"With Stewart's broad experience in economic development finance, we'll see more benefits in the programs we provide to new and existing industry," Phillips said. "I am confident that Stewart will continue the tradition of excellence Bruce has started." ❖

North Carolina Market Prices for Recyclables

Prices current as of June 25, 1996

Item	Western Region	Central Region	Eastern Region
Metals			
Aluminum Cans, lb loose	$0.43	$0.43	$0.51 lb/baled
Steel Cans, gross ton baled	$72	$62	$62 ton
Plastics			
PETE, lb baled	$0.09	$0.11	$0.09
HDPE, lb baled	$0.10	$0.08	$0.06
Paper			
Newsprint, ton baled	$30	$20	$35
Corrugated, ton baled	$50	$20	$45
Office, ton baled	$120	$115	$100
Magazines, ton baled	'$40	$0	**
Mixed, ton baled	*o	$45	$0
Glass			
Clear, ton crushed	$44	$40	$30
Brown, ton crushed	$22	$20	$25
Green, ton crushed	$15	$8	$2

•Denotes that magazines are included with mixed paper. •* Denotes that magazines are included with newsprint.

Note: The prices listed above are compiled by the RBAC and are for reference only. These prices are not firm quotes. RBAC obtained pricing reformation from buyers within each category and developed a pricing range.

The RBAC is a program of the NC Division of Pollution Prevention and Environmental Assistance

Call (919) **715-6500** or 1-600-763-0136 **for** free technical assistance and information about preventing, reducing, and recycling waste.

RBAC IS ON THE NET!!!

The RBAC can now be accessed through the Internet. Visit us at http: //www.owr.ehnr. state. nc. us/rbac1.htm

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